CLAIMS

What is claimed is:

1. A method of searching for a match in a database of a plurality of records, where the records in the database correspond to recordings containing waveforms, comprising:

generating an amplitude signature for at least one segment of a selected recording; and

determining at least one matching record in the database for the selected recording based on the amplitude signature.

2. A method as recited in claim 1,

further comprising calculating approximate length information for the records in the database and for the selected recording, and

wherein said determining is also based on the approximate length information.

3. A method as recited in claim 2, wherein the recordings have at least one track

wherein said calculating calculates a length of each track of each recording represented in the database and for the selecting recording, and

wherein said determining is also based on the number and length of tracks of the recordings represented in the database and the selected recording.

4. A method as recited in claim 3, wherein the waveforms are represented by sampled digital data in the recordings and the selected recording,

wherein said method further comprises storing an existing signature array for each of the recordings represented in the database, where each element of the existing signature array corresponds to a number of occurrences of the sampled digital data within an amplitude band in at least one segment of the recordings represented in the database, and

wherein said generating produces an identifying signature array with each element of the identifying signature array corresponding to a number of occurrences of the sampled digital data within an amplitude band in the at least one segment of the selected recording.

5. A method as recited in claim 4, wherein said determining includes

calculating an average difference between the elements of the identifying signature array and the existing signature array for the recordings represented in the database; and

identifying as a possible match any recording represented in the database for which the average difference is greater than a predetermined value.

6. A method as recited in claim 4, wherein said determining includes

calculating a matching percentage of corresponding elements in the identifying signature array and the existing signature arrays within a predetermined number of each other; and

indicating as a possible match any recording represented in the database for which the matching percentage is greater than a predetermined percentage.

7. A method as recited in claim 6, wherein the predetermined number is zero and the predetermined percentage is approximately 70%.

8. A method as recited in claim 6, wherein the predetermined number is one and the predetermined percentage is approximately 80%.

9. A method as recited in claim 4, wherein the recordings are stored on removable storage media possessed by the user.

10. A method as recited in claim 4, wherein the recordings are digital files stored on mass storage accessible by a listener of the selected recording.

11. A method as recited in claim 3, further comprising receiving a query to search for a match between the selected recording and the records in the database, the query including the number of tracks and the length information for the selected recording.

12. A method as recited in claim 1, wherein the waveforms are represented by sampled digital data in the recordings and the selected recording,

wherein said method further comprises storing an existing signature array for each of the recordings represented in the database, where each element of the existing signature array corresponds to a number of occurrences of the sampled digital data within an amplitude band in at least one segment of the recordings represented in the database, and

wherein said generating produces an identifying signature array with each element of the identifying signature array corresponding to a number of occurrences of the sampled digital data within an amplitude band in the at least one segment of the selected recording.

13. A method as recited in claim 12, wherein said determining includes

calculating an average difference between the elements of the identifying signature array and the existing signature array for the recordings represented in the database; and

identifying as a possible match any recording represented in the database for which the average difference is greater than a predetermined value.

14. A method as recited in claim 13, wherein said determining includes

calculating a matching percentage of corresponding elements in the identifying signature array and the existing signature arrays within a predetermined number of each other; and

indicating as a possible match any recording represented in the database for which the matching percentage is greater than a predetermined percentage.

15. A method as recited in claim 14, wherein the predetermined number is zero and the predetermined percentage is approximately 70%.

16. A method as recited in claim 14, wherein the predetermined number is one and the predetermined percentage is approximately 80%.

17. A method as recited in claim 12, wherein the recordings are stored on removable storage media possessed by the user.

18. A method as recited in claim 17, wherein the recordings are digital files stored on mass storage accessible by a listener of the selected recording.

19. A method as recited in claim 11,

wherein the selected recording is played at a first location on equipment possessed by a user, and

wherein said method further comprises:

generating a query by the equipment at the first location; and

sending the query to a server at a second location where the database is stored, to search for at least one matching record.

20. A method as recited in claim 19, further comprising sending from the server to the equipment at the first location additional information stored in the at least one approximately matching record and not included in the selected recording.

21. A database system, comprising:

a storage unit storing a database of records including existing signatures for recordings corresponding to the records; and

a processing unit, coupled to said storage unit, programmed to generate an identifying amplitude signature for a selected recording, and to determine at least one matching record in the database for the selected recording by comparing the identifying amplitude signature with the existing amplitude signatures in the database.

22. A database system as recited in claim 21,

wherein said storage unit further stores information indicating length and number of identified segments of the recordings, and

wherein said processing unit calculates approximate length information for the selected recording and further determines the at least one matching record in the database based on the approximate length information and a number of identified segments in the selected recording and the recordings corresponding to the records in the database.

23. A database system as recited in claim 21, wherein the recordings contain sampled digital data,

wherein said storage unit stores the existing signature array with each element corresponding to a number of occurrences of the sampled digital data within an amplitude band in at least one segment of the recordings represented in the database, and

wherein said processing unit generates the identifying signature array with each element corresponding to a number of occurrences of the sampled digital data within an

amplitude band in at least one segment of the selected recording and determines the at least one matching record by calculating an average difference between the elements of the identifying signature array and the existing signature array for the recordings represented in the database and identifying as a possible match any recording represented in the database for which the average difference is greater than a predetermined value.

24. A database system as recited in claim 21, wherein the recordings contain sampled digital data,

wherein said storage unit stores the existing signature array with each element corresponding to a number of occurrences of the sampled digital data within an amplitude band in at least one segment of the recordings represented in the database, and

wherein said processing unit generates the identifying signature array with each element corresponding to a number of occurrences of the sampled digital data within an amplitude band in at least one segment of the selected recording and determines the at least one matching record by calculating a matching percentage of corresponding elements in the identifying signature array and the existing signature arrays within a predetermined number of each other and indicating as a possible match any recording represented in the database for which the matching percentage is greater than a predetermined percentage.

25. A database system as recited in claim 21, further comprising a communication unit, coupled to said storage unit, to receive a query to search for a match between the selected recording and the records in the database, the query including the number of segments and the length information for the selected recording.

26. A database system as recited in claim 25, wherein the recordings corresponding to the records in the database and the selected recording each contain at least an audio portion and the number of segments are the number of tracks in the audio portion.

27. A database system as recited in claim 26, wherein the recordings are stored on removable storage media possessed by the user.

28. A database system as recited in claim 26, wherein the recordings are digital files stored on mass storage accessible by a listener of the selected recording.

29. A database system as recited in claim 25,

wherein said processing unit, storage unit and communication unit are at a first location, and

wherein said database system further comprises:

equipment possessed by a user at a second location, remote from the first location, to generate the query and play the selected recording; and

a communication network at least temporarily coupling said equipment and said communication unit to send the query from said equipment to said communication unit.

30. A database system as recited in claim 29, wherein said communication unit sends to the equipment via said communication network additional information stored in the at least one approximately matching record and not included in the selected recording.

31. At least one computer program stored on a computer-readable medium, embodying a method of searching for a match in a database of a plurality of records, where the records in the database correspond to recordings containing waveforms, comprising:

generating an amplitude signature for at least one segment of a selected recording; and

determining at least one matching record in the database for the selected recording based on the amplitude signature.

32. At least one computer program as recited in claim 31,

further comprising calculating approximate length information for the records in the database and for the selected recording, and

wherein said determining is also based on the approximate length information.

33. At least one computer program as recited in claim 32, wherein the recordings have at least one track

wherein said calculating calculates a length of each track of each recording represented in the database and for the selecting recording, and

wherein said determining is also based on the number and length of tracks of the recordings represented in the database and the selected recording.

34. At least one computer program as recited in claim 33, wherein the waveforms are represented by sampled digital data in the recordings and the selected recording,

wherein said method further comprises storing an existing signature array for each of the recordings represented in the database, where each element of the existing signature array corresponds to a number of occurrences of the sampled digital data within an amplitude band in at least one segment of the recordings represented in the database, and

wherein said generating produces an identifying signature array with each element of the identifying signature array corresponding to a number of occurrences of the sampled digital data within an amplitude band in the at least one segment of the selected recording.

35. At least one computer program as recited in claim 34, wherein said determining includes

calculating an average difference between the elements of the identifying signature array and the existing signature array for the recordings represented in the database; and

identifying as a possible match any recording represented in the database for which the average difference is greater than a predetermined value.

36. At least one computer program as recited in claim 34, wherein said determining includes

calculating a matching percentage of corresponding elements in the identifying signature array and the existing signature arrays within a predetermined number of each other; and

indicating as a possible match any recording represented in the database for which the matching percentage is greater than a predetermined percentage.

37. At least one computer program as recited in claim 34, wherein the recordings are stored on removable storage media possessed by the user.

38. At least one computer program as recited in claim 34, wherein the recordings are digital files stored on mass storage accessible by a listener of the selected recording.

39. At least one computer program as recited in claim 33, further comprising receiving a query to search for a match between the selected recording and the records in the database, the query including the number of tracks and the length information for the selected recording.

40. At least one computer program as recited in claim 31, wherein the waveforms are represented by sampled digital data in the recordings and the selected recording,

wherein said method further comprises storing an existing signature array for each of the recordings represented in the database, where each element of the existing signature array corresponds to a number of occurrences of the sampled digital data within an amplitude band in at least one segment of the recordings represented in the database, and

wherein said generating produces an identifying signature array with each element of the identifying signature array corresponding to a number of occurrences of the sampled digital data within an amplitude band in the at least one segment of the selected recording.

41. At least one computer program as recited in claim 40, wherein said determining includes

calculating an average difference between the elements of the identifying signature array and the existing signature array for the recordings represented in the database; and

identifying as a possible match any recording represented in the database for which the average difference is greater than a predetermined value.

42. At least one computer program as recited in claim 40, wherein said determining includes

calculating a matching percentage of corresponding elements in the identifying signature array and the existing signature arrays within a predetermined number of each other; and

indicating as a possible match any recording represented in the database for which the matching percentage is greater than a predetermined percentage.

43. At least one computer program as recited in claim 40, wherein the recordings are stored on removable storage media possessed by the user.

44. At least one computer program as recited in claim 43, wherein the recordings are digital files stored on mass storage accessible by a listener of the selected recording.

45. At least one computer program as recited in claim 40,

wherein the selected recording is played at a first location on equipment possessed by a user, and

wherein said method further comprises:

generating a query by the equipment at the first location; and

sending the query to a server at a second location where the database is stored, to search for at least one matching record.

46. At least one computer program as recited in claim 45, further comprising sending from the server to the equipment at the first location additional information stored in the at least one approximately matching record and not included in the selected recording.